



LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE

For the Technical Direction of the LTPP Program



Program Area: **Monitoring/ Information Management System**

Directive: **IMS-37**

Date: **20 December 1995**

Subject: **Processing of Global Positioning Measurements**

To ensure the availability of accurate section or project location data, Global Positioning System (GPS) receivers are being used by the Regional Coordination Office Contractors (RCOCs) to measure the latitude and longitude of all test sections included in the LTPP program. Detailed instructions and Inventory Data Sheet 1A for measuring and recording these data were distributed in under LTPP Directive S-10: Global Positioning Measurements, issued July 27, 1994. The purpose of this directive is to provide instructions regarding the processing and entry of these data into the LTPP IMS.

Effective immediately, the RCOCs are required to start review of the collected data and entry of satisfactory GPS derived latitude and longitude data collected to date into the IMS.

1. Data Review and Report

The reasonableness of the GPS measurements should be reviewed prior to entry into the IMS. Further investigation of either the GPS measurement or elevation contained in the IMS should be performed if any of the following conditions are met:

- C If the GPS measured longitude or latitude varies from the previously entered coordinates by more than 10 minutes.
- C If the Estimated Position Error (EPE) is greater than 200 m.
- C If the GPS measured elevation differs from the previous entered elevation by more than ± 150 m. In this case, reference should be made to the construction plans or other information to confirm the actual elevation since the error in the GPS elevation measurements have been found, in some cases, to be somewhat significant.

- C If the new coordinates are in an illogical location, i.e. in the ocean, another country or state, etc.

To aid in this review by the RCOC and to provide a means for a more global check of the measurements, the RCOCs are required to submit a tabular summary of the status of the GPS data collection and entry efforts following the format specified in Attachment A. This report should be submitted on January 1, 1996, and then on April 1, 1996 -- i.e., two submittals. Submittal of the detailed report table shall be done using an electronic medium in a conventional spreadsheet format such as Excel or Lotus. The reports shall be submitted to FHWA with a copy to the FHWA LTPP Technical Assistance Contractor (TAC).

2. IMS Entry

After the reasonableness of the new measurements has been checked and verified by the RCOC, entry of these data into the IMS shall be accomplished using the RIMS entry screen used to enter the original location information -- i.e., Inventory Data Sheet 1 for GPS and SPS 5, 6, and 7 projects, Construction Data Sheet 1 for SPS 1, 2 and 8 projects. While other information (elevation, DOP, EPE, etc.) is collected and recorded as part of the GPS data collection plan, only GPS measured latitude and longitude shall be entered into the IMS (refer to LTPP Directive S-10). The GPS measured latitude and longitude measurements should be entered into the IMS to the nearest tenth of a second. If the previously entered elevation is found to be incorrect, the correct elevation, based on other than the GPS measurement, should also be input at this time.

During entry of this data, the date of the GPS measurement must be entered in the "DATE OF DATA COLLECTION OR UPDATE" field. Data entry is accomplished by over-writing the existing data displayed on the data entry screen with the new data. All the tools required to enter these data into the IMS are currently in place and the RCOC staffs should be intimately familiar with all of the required data entry steps. A check for transcription errors should be performed after entry of this data by someone other than the person who entered the data. After entry of these new coordinates, the IMS will automatically reset RECORD_STATUS back to Level A. A full compliment of QA checks shall then be executed to check this newly entered data and achieve a RECORD_STATUS of E.

Monte Symons,
LTPP Team Leader

Attachment A. Report format for status of location measurements using GPS device.

Reporting Date: _____

Region: _____

Summary Status Report for GPS Measurements

| | Number in Region (A) | No. with Acceptable GPS Measurement (B) | No. Entered into IMS © | No. where Measurement Attempted but Unsuccessful | Percent Measurement Complete (B/A)*100 | Percent Entered into IMS (C/A)*100 |
|-----------------|-------------------------------|--|---------------------------------|---|---|---|
| GPS Sections | | | | | | |
| SPS Projects | | | | | | |

Detailed Report (In electronic spreadsheet format)

| Section/ Project ID | Previous Inventory Data | | | GPS Measurement | | | |
|---------------------------|-------------------------|-----------|-----------|-----------------|-----------|-----------|-----|
| | Latitude | Longitude | Elevation | Latitude | Longitude | Elevation | EPE |
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Notes:

Elevation should be in meters

EPE, Estimated Position Error should be in meters.